

REMARKS

Reconsideration and allowance of this application are respectfully requested. New claims 8-12 have been added. Claims 1-12 are now pending in the application. The rejections are respectfully submitted to be obviated in view of the remarks presented herein.

Applicant notes that the Examiner did not acknowledge receipt of the certified copy of the priority document filed April 3, 2001. Applicant respectfully requests acknowledgment by the Examiner of the certified copy of the priority document in the next office communication.

Rejection Under 35 U.S.C. § 103(a) - Applicant Admitted Prior Art in view of Teng et al.

Claims 1, 5 and 7 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the Applicant Admitted Prior Art in view of Teng et al. (U.S. Patent Number 5,285,280; hereinafter "Teng"). The rejection is respectfully traversed.

Independent claim 1 relates to an apparatus for adjusting filter tap length of an adaptive equalizer. The claimed apparatus includes a multipath detector and a tap length adjusting unit. The multipath detector detects multipath information from a difference between the correlation values of input data applied to the adaptive equalizer and a training sequence, and from an auto correlation value of a training sequence when the training sequence is valid. The tap length adjusting unit generates a tap length control signal based on positions of the farthest pre-/post-ghosts by using the detected multipath information and a field sync signal.

Turning to the cited art, the Description of the Related Art section of the present application describes a data frame of a vestigial side band transmission system as shown in

Figure 1a. Additionally, a data field sync segment is described with reference to Figure 1b. In an adaptive equalizer, the number of taps “is generally determined by the maximum range of ghosts to be canceled” (page 2, lines 16-18). Conventionally, 63 symbol sequences in which symbols of training sequences are alternately reversed have been used to detect and cancel ghosts (page 2, lines 18-20). This conventional detection and cancellation method suffers from a very limited range and a delayed ghost detection time due to the properties of the sequences (page 3, lines 3-15).

Examiner maintains that the combination of Applicant Admitted Prior Art and Teng teaches each feature of the claimed invention. However, Prior Art Figures 1a and 1b solely teach a structure of a data frame. Furthermore, the Description of the Related Art section only generally mentions that the number of taps of the adaptive equalizer is generally determined by the maximum range of ghosts to be canceled. There is no teaching or suggestion in the Description of the Related Art section of an apparatus for adjusting a filter tap length for an adaptive equalizer.

On the other hand, the claimed apparatus comprises “a multipath detector for detecting multipath information from a difference between the correlation values of input data applied to the adaptive equalizer and a training sequence, and from an auto correlation value of a training sequence when the training sequence is valid; and a tap length adjusting unit for generating a tap length control signal based on positions of the farthest pre-/post-ghosts by using the detected multipath information and a field sync signal.” There is no mention in the Description of the Related Art section of any of these elements, as claimed. The Examiner also readily admits in

paragraph 3 of the Office Action that the Description of the Related Art section does not disclose implementing the correlation values so as to adaptively adjust the equalizer tap length. In addition, the assertion that the present invention discloses as prior art, the determination of tap length of the adaptive equalizer in a variable manner by using pre-/post-ghosts farthest from the main tap, is improper because the Examiner's assertion is derived from the disclosure in the specification on page 13, lines 10-12, which describes an embodiment of Applicant's invention.

Teng does not remedy the deficiencies of the Description of the Related Art section. Teng teaches the cancellation of ghosts in a received video signal by using a tap coefficient signal computed by dividing an auto-correlation of an ideal ghost cancellation reference (GCR) signal by the cross-correlation of the ideal and received GCR signals (column 4, lines 29-40). The tap coefficients are transferred to a FIR filter which filters the received video signal with these coefficients to cancel nearby ghosts (column 6, lines 49-52). Additionally, a prior art ghost canceling channel equalizer is also described with reference to Figures 2(b) and 2(c). A received GCR signal is extracted from a received video signal and compared to an ideal GCR signal. Based on a discrepancy between the received and ideal GCR signals, tap coefficients are generated and used in a transversal filter for canceling ghosts (column 2, lines 12-32).

However, there is no teaching or suggestion in Teng of detecting multipath information from a difference between the correlation values of input data and a training sequence, and from an auto correlation value of a training sequence when the sequence is valid, as claimed. Teng also fails to teach or suggest generation of a tap length control signal based on positions of the farther pre-/post-ghosts by using the detected multipath information and a field sync signal, as

claimed. Teng calculates tap coefficients by dividing the auto-correlation of an ideal GCR by the cross-correlation of the ideal and received GCR signals. Alternatively, as described by figures 2(b) and 2(c), Teng calculates tap coefficients based on a discrepancy between received and ideal GCR signals, however, this difference is not found from between the specific correlation values as recited in the claims.

At least by virtue of the aforementioned differences, the invention defined by claim 1 is patentable over the Applicant Admitted Prior Art in view of Teng.

Independent claim 5, which has been amended to improve clarity, relates to a method for adjusting filter tap length of an adaptive equalizer. For the same reasons discussed above with regard to claim 1, the combination of the Description of the Related Art section and Teng fail to teach at least detecting multipath information from a difference between correlation values of input data applied to the adaptive equalizer and a reference signal, and from an auto correlation value of a training sequence, as required by claim 5.

At least by virtue of the aforementioned differences, the invention defined by claim 5 is also patentable over the Applicant Admitted Prior Art in view of Teng. Similarly, dependent claim 7 is patentable over the Applicant Admitted Prior Art in view of Teng at least by virtue of its dependency on claim 5.

Rejection Under 35 U.S.C. § 103(a) - Applicant Admitted Prior Art in view of Teng et al. in further view of Whitaker in further view of “thefreedictionary.com”

Claims 2 and 6 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the Applicant Admitted Prior Art in view of Teng et al. in further view of Whitaker (tvhandbook.com: ATSC DTV Receiver Systems; Chapter 17.2) in further view of “www.thefreedictionary.com.” The rejection is respectfully traversed.

The combination of the Description of the Related Art section and Teng do not teach or suggest every element of Applicant’s apparatus and method for adjusting filter tap length as recited in claims 1 and 5. Additionally, as admitted by Examiner in paragraph 4 of the Office Action, the Applicant Admitted Prior Art in view of Teng does not teach or suggest a first and second multiplexer for enabling the input data and reference signal when the sync signal is “high.” Whitaker and “thefreedictionary.com” do not remedy these deficiencies.

Whitaker discloses data field sync detection by comparing each received data segment from an A/D converter with ideal field 1 and field 2 reference signals to obtain a symbol-by-symbol difference in a receiver as shown in Figure 17.2.6 (section 17.2.2e). An equalizer compensates for ghosts by using a least-mean-square (LMS) algorithm to compute adjustment of filter taps. A generated estimate of error is correlated with various delayed data signals, with the correlations corresponding to the adjustment needed to be made for each tap to reduce the error at the output (section 17.2.2g). Equalizer training signals consisting of pseudonoise sequences are major parts of the data field sync. The equalizer training signals are made up of 700 symbols (511+63+63+63), as shown in Figure 17.2.15 (section 17.2.2l). The Examiner has cited

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“thefreedictionary.com” solely to offer a definition of a multiplexer, such that “a two input multiplexer is a simple connection of logic gates whose output Y is either input A or input B depending on the value of a third input S which selects the input.”

However, there is no teaching or suggestion in either Whitaker or “thefreedictionary.com” of at least detecting multipath information from a difference between the correlation values of input data applied to the adaptive equalizer and a training sequence, and from an auto correlation value of a training sequence. There is no mention in Whitaker or “thefreedictionary.com” of using an auto correlation value of the training sequence in obtaining a difference for detecting multipath information. Additionally, the equalizer training signals of Whitaker are made up of 700 symbols. On the other hand, the claimed training sequence/reference signal is 704 symbols. At least by virtue of the aforementioned differences, the invention defined by claims 2 and 6 are patentable over the Applicant Admitted Prior Art in view of Teng in further view of Whitaker in further view of “thefreedictionary.com.”

Accordingly, claims 2 and 6 should be allowable over the combined references.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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Respectfully submitted,

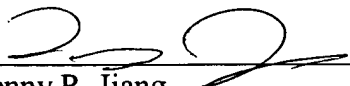
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